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ABSTRACT

The Bureau of Educational Research and Service at the University of Tennessee, Knoxville (UTK) conducted the 1981-82 evaluation of the Tennessee Nutrition Education and Training Program. Instruments developed, field tested, and revised by the UTK team were used to assess the nutrition knowledge, attitudes, practices, and perceptions of students receiving instruction from teachers participating in the project. This report of the project evaluation is divided into five sections. Section 1 discusses the evaluation design and section 2 reports on assessment of student outcomes. Section 3 examines the teacher's log of nutrition education activities. Section 4 details results from the Teaming to Teach Nutrition Questionnaire, and section 5 reports on end-of-year assessments by project personnel. Also included are 12 tables, references, and six appendices of materials used in the project. (JM)

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EVALUATION OF THE IMPLEMENTATION GRANT PROJECT OF TENNESSEE'S NUTRITION EDUCATION AND TRAINING PROGRAM 1981-82

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ABSTRACT

During the 1981-82 school year the State Coordinator of Tennessee's Nutrition Education and Training (NET) Program conducted an Implementation Grant project designed to increase the number of students in Tennessee's public schools who were receiving instruction in nutrition. Twenty-one school systems received Implementation Grants which enabled system personnel to provide training and support for 940 teachers in 50 elementary schools who agreed to use in their classrooms a curriculum guide supplied by the State Coordinator. The guide, entitled "TENN (Tennessee Educates for Nutrition Now) Instructional Plan," had been developed, field-tested, evaluated, and revised during the two preceding years by a team of faculty and graduate students at the University of Tennessee, Knoxville (UTK).

For the third year staff in the Bureau of Educational Research and Service at UTK conducted the 1981-82 evaluation of the Tennessee NET Program. Instruments developed, field-tested, and revised by the UTK team were used in a posttest-only design to assess the nutrition knowledge, attitudes, and practices, and perceptions of nutrition education of students receiving instruction from teachers participating in the Implementation Grant project. As a control procedure the scores of elementary students exposed to the TENN Instructional Plan were compared with scores of students in a sample of comparison schools in which the Instructional Plan had not been introduced. Additional evaluative procedures incorporated the collection of descriptive data from project directors and participating teachers and food service managers.

The evaluators judged the Implementation Grant project effective according to several criteria. At every grade level K-6 students receiving the specified nutrition education program achieved higher knowledge scores on the assessment instruments than did their peers in comparison schools. At four grade levels students in treatment schools also achieved higher scores on the attitude scales. Treatment students demonstrated a higher degree of awareness of nutrition-related issues than students not exposed to the Instructional Plan. Teachers gave high ratings (3.99 to 4.55 on a 5-point scale) to the levels of learning and interest associated with the nutrition education activities suggested in the TENN Instructional Plan. Teachers using the Instructional Plan reported involving many more members of the school community (a technique recommended in the Plan) in providing nutrition instruction than did teachers in comparison schools. Both participating teachers and Implementation Grant project directors gave high marks (ratings of 3.57 to 4.4 on a 5-point scale) to the effectiveness of the Instructional Plan. These individuals identified as "the most significant benefits" of the project: (1) excellent instructional materials, (2) increased student awareness of nutrition and its relationship to health and growth, and (3) increased opportunities for students to read about and taste new foods.

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EVALUATION OF THE IMPLEMENTATION GRANT PROJECT OF TENNESSEE'S NUTRITION EDUCATION AND TRAINING PROGRAM 1981-82

SECTION I. THE EVALUATION DESIGN

Background

The Tennessee Nutrition Education and Training (NET) Program is a component of a national effort to develop a coordinated nutrition education program for children from preschool through Grade 12. Federal funding for this work was supplied by the U.S. Department of Agriculture. Origins of the program can be traced to Public Law 95-166, the National School Lunch Act and Nutrition Amendments of 1977, which provided under Section 19 for a program of "Nutrition Education and Training." This legislation authorized funding to carry out a nutrition information and education program through a system of grants to state agencies to provide for (a) training in nutrition for educators and school food service personnel, (b) training in food service management for school food service personnel, and (c) conducting nutrition education activities in schools and child care institutions. The undertaking which is the subject of this report addressed components (a) and (c).

In late Spring 1981 the State Coordinator of Tennessee's NET Program solicited proposals from school systems throughout the State for participation in an Implementation Grant project. The request for proposals stated that elementary schools in selected systems would receive copies of the "TENN (Tennessee Educates for Nutrition Now) Instructional Plan" (Tennessee Department of Education, 1981); a collection of supplementary instructional materials such as booklets, filmstrips, and games; and a grant to cover the costs of consultants' time, inservice training, and additional instructional supplies and materials. (A listing of the materials supplied by the State appears in Appendix A.) In return personnel in participating systems were to train and encourage teachers to use the Instructional Plan and accompanying materials in providing a program of nutrition education for their students during the 1981-82 school year.

In June 1981 the State NET Coordinator approved grant awards for 21 school systems. The Implementation Grant projects in these systems involved a total of 50 elementary schools and 940 teachers. Sufficient copies of the TENN Instructional Plan for each participating teacher to have the section developed for his/her grade level, and one box of supplementary materials for each 15 participating teachers, were supplied to each project director by the State Coordinator. During the late summer or early fall each project director provided for participating teachers in-service training in the use of the Instructional Plan and other materials.

In July 1981 the State NET Coordinator contracted with the Bureau of Educational Research and Service (BERS) in the College of Education at the University of Tennessee, Knoxville for a comprehensive evaluation of the Implementation Grant project. Staff conducting the evaluation included Dr. Trudy W. Banta, Professor of Education, Dr. Jo Lynn Cunningham, Professor in Child and Family Studies, and Ms. Wilma Jozwiak, doctoral student in Child and Family Studies. Each of these staff members had provided leadership during the previous two years for the evaluation of Tennessee's NET Program (see Banta et al., 1980 and 1981).

During the 1979-80 academic year, a group of faculty and graduate students at the University of Tennessee, Knoxville (UTK) spent four months identifying, and then validating via consultant review, a set of nutrition education goals and objectives (see Appendix B) to be attained by students in Grades K-12 in Tennessee. The team included specialists in nutrition and food science; human development; consumer studies; early childhood, elementary, secondary, and adult education; and measurement and evaluation. Early in 1980 the same team of specialists constructed developmentally appropriate instructional materials for use by teachers in Grades K-6. Later in the year a second team which included some of the same specialists devised a series of assessment instruments for students in Grades K-6 which measured student achievement of the specified goals and objectives.

Because previous assessments of achievement associated with nutrition education programs have been criticized for dealing only with knowledge, and neglecting attitudes and practices of program participants, affective and behavioral as well as cognitive components were included in the assessment instruments for use in Tennessee. Forms for students at five developmental levels (Grades K-1, 2-3, 4-6, 7-9, and 10-12) incorporated a measure of nutrition knowledge, self-report measures of nutrition attitudes and practices, and perceptions of nutrition education. The series of assessment instruments was entitled "Comprehensive Assessment of Nutrition Knowledge, Attitudes, and Practices, and Perceptions of Nutrition Education," or CANKAP (Cunningham et al., 1981).

For the Implementation Grant project an evaluation plan was developed which included:

(1) utilization of CANKAP instruments for Grades K-6 in a posttest-only control group design for assessing student outcomes, and

(2) collection of three types of evaluative data from project staff, including:

   (a) information from every participating teacher concerning the instructional activities which they used with students;

   (b) information from treatment and control group teachers concerning their use of teams to deliver nutrition education; and

   (c) reactions of project directors, teachers, and food service managers to specific aspects of the project upon its conclusion.

Sources of Data

Assessment of Student Outcomes

A posttest-only control group design was employed to assess the impact on student learning of the instruction in nutrition education provided via the Implementation Grant project. The assessment instruments were those which had been developed for K-6 students at UTK in 1980 and revised in 1981 (Cunningham, et al., 1981). The impact measured included students' nutrition knowledge, attitudes, and practices, and perceptions of nutrition education.

In September 1981 eleven school systems that had received Implementation Grants were selected by the evaluators to serve as testing sites. The eleven systems taken together included more than a majority of the students reached by the Implementation Grants, and each system met two important criteria:

(1) all grade levels K-6 were included in the local project, and

(2) the system contained at least one set of grades K-6 that could serve as a control by virtue of having had no previous contact with the NET program.

The school systems selected to serve as testing sites were:

Greene County	Memphis City
Hamilton County	Metropolitan Public
Jackson City	Monroe County
Jackson County	Perry County
Marshall County	Sumner County
Maury County	

Superintendents of these eleven systems were contacted by letter to ascertain their willingness to allow students in one set of grades K-6 in Implementation Grant -- "treatment" -- schools and those in a designated control set of grades K-6 to be tested in Spring 1982 using the assessment instruments designed for this purpose by UTK personnel. In addition, the superintendent was asked to name a contact person who would participate in a training session in March 1982 and carry out subsequent testing activities in both treatment and control schools. All eleven superintendents agreed to allow the required testing to take place at the designated schools.

In March 1982 a training session for contact persons was conducted by the evaluators in Murfreesboro, Tennessee, a point near the geographical center of the state. All eleven systems were represented at the session. Sufficient copies of testing materials for students in grades K-6 in both treatment and control schools were provided for each contact person.

Testing of the students in treatment and control schools was accomplished in April and May 1982. In most cases the contact persons trained to conduct the testing program did in fact administer the tests. Completed answer sheets and/or test forms were returned to the evaluators by early June.

Teacher's Log

The evaluators designed a form entitled "Teacher's Log of Nutrition Education Activities," copies of which were sent in September 1981 and January 1982 to Implementation Grant project directors for distribution to each of the 940 participating teachers. A copy of the Teacher's Log appears in Appendix C. Teachers were asked to complete one copy of the Log to describe activities used during the first half of the year (August through January), and another copy to describe activities used during the second half (February through June). The principal pieces of information collected via the Teacher's Log were:

(1) types of instructional activities used by Implementation Grant teachers in teaching nutrition education,

(2) an assessment of the level of student learning and interest associated with each instructional activity, and

(3) types of resources -- both personnel and materials -- utilized in teaching nutrition education.

Assessment of Teachers' Teaming to Teach Nutrition

Throughout the TENN Instructional Plan teachers were encouraged to utilize resource persons in their delivery of nutrition education. Suggested activities recommended the involvement of school food service personnel, other teachers, parents, nutrition specialists, and others in teaching various concepts. Since the use of teams has been found to be an effective means of promoting learning, Ms. Jozwiak chose as the topic of her doctoral dissertation an assessment of teaming to teach nutrition among teachers in the eleven sets of Implementation Grant "treatment" and control schools. A survey instrument (see Appendix D) was designed to gather from these teachers information concerning the:

(1) number of teachers using teams to teach nutrition,

(2) types of personnel participating in such teams, and

(3) types of instructional activities used by the teams.

End-of-Year Assessments by Project Personnel

In April 1982 the evaluators sent to each project director a series of three similar questionnaires which were designed to provide an end-of-year evaluation of the Implementation Grant project. One form was to be completed by the project director, and two other forms were included for distribution to teachers and food service managers who had participated in the project. Copies of the three questionnaires appear in Appendix E.

The questionnaires for teachers and project directors contained questions concerning the:

(1) format and quality of training in nutrition education which was provided for participating teachers;

(2) quality of instructional materials provided as part of the project;

(3) level of interest in, and support for, the project, and/or involvement of, each of several groups connected with the project;

(4) most significant benefits and disadvantages associated with carrying out the Implementation Grant project; and

(5) extent to which the TENN Instructional Plan would be used during the 1982-83 school year.

The form designed for food service managers contained an inquiry about the extent to which the managers had participated in a number of nutrition education activities during the school year. In addition, each manager was asked for an assessment of the level of interest or involvement of students, teachers, and parents in the nutrition education project.

Taken together the three end-of-year assessment forms provided information for formative evaluation of the in-service training process and summative evaluation of NET instructional materials.

SECTION II. ASSESSMENT OF STUDENT OUTCOMES

Nutrition Knowledge, Attitudes, and Practices

Jo Lynn Cunningham

Nutrition knowledge, attitudes, and practices were assessed using the revised version of the Comprehensive Assessment of Nutrition Knowledge, Attitudes, and Practices (CANKAP) (Cunningham et al., 1981). This instrument was developed specifically for the Tennessee NET program, and was based on the same goals/objectives framework as that used for the TENN Instructional Plan which provided the foundation for the Implementation Grant projects. The Instrument was revised to correspond to minor modifications of the goals/objectives framework that were made during revision of the K-6 Instructional Plan. The revised CANKAP was administered as part of the questionnaire "Assessment of Nutrition Knowledge, Attitudes, and Practices and Perceptions of Nutrition Education" (Banta et al., 1980) to students at grade levels K-6 in both treatment and comparison schools.

Analysis Procedures

Two basic approaches were taken with the statistical analysis of the nutrition knowledge, attitudes, and practices data. In each case, separate analyses were conducted for each grade level.

With the first approach, a simple comparison between the scores for participants in the treatment group and those in the comparison group was made. For this comparison, a one-way analysis of variance (ANOVA) model was used, with the individual as the unit of analysis. A multivariate analysis of variance (MANOVA) was computed using knowledge, attitudes, and practices as the dependent variables; in addition, the associated ANOVAs were computed. A test for homogeneity of variance was computed for each set of data; in the one case in which the test was significant (i.e., the variances of the treatment and comparison groups were unequal), the separate variances were used; otherwise, the pooled variance was used. An advantage of this first analytical approach is that the sample size was large enough to permit a meaningful analysis. A disadvantage is that the assumption of independence of observations was violated by ignoring the school or classroom with which the individuals were associated.

The second analytical approach was similar to the first except that the school was used as the unit of analysis. Otherwise, the same procedures were followed. An advantage of this second approach is that it was consistent with the idea of a school as a unit of analysis (particularly relevant with the team approach stressed in the nutrition education program). A limitation, however, is that the number of schools was very small, making the test a very conservative one.

An alpha level of .05 was used as the criterion for significance with all analyses. This criterion is more stringent than that used for evaluations conducted in previous years. However, because both the instrument (in an earlier version) and the Instructional Plan (also in an earlier version) had been used and evaluated previously, it seemed warranted to use the more conservative approach despite the limitations of statistical power resulting from design limitations.

In analyzing results, univariate analyses were considered independently of multivariate analyses. Thus, several univariate differences were identified that were not reflected in significant multivariate results. Such significant univariate differences (without significant multivariate differences) occurred only in analyses in which the school was the unit of analysis. This more liberal reporting strategy appears justified in these cases because of the power limitations resulting from the small sample sizes.

Results

As shown in Table 1, the multivariate test was significant in all analyses in which the individual was used as the unit of analysis. There also were differences in knowledge in all tests for which the individual was used as the unit of analysis, and the test for attitudes was significant for students in kindergarten and grades 1, 5, and 6. All differences were in favor of students in the treatment group.

As shown in Table 2, the multivariate test was significant only at grade 3 when the school was used as the unit of analysis. However, knowledge was significant for grades 1, 2, 3, and 4, and attitude differences were shown for kindergarten and grade 6. Again, all differences were in favor of schools in the treatment group.

Discussion

If nutrition beliefs--represented by knowledge, attitudes, and practices considered both individually and collectively--are taken as a criterion, the Implementation Grant program must be considered a definite success. Students in the treatment schools (those receiving the nutrition education program) had higher scores than their peers in the comparison schools. When the analysis was focused on individuals, multivariate and knowledge differences were reflected at all seven grade levels and attitude differences at four grade levels. When the focus was on the school, there were higher scores on at least one dimension for treatment schools than for comparison schools at six of the seven grade levels (i.e., every level but grade 5). Despite the limitations inherent in the various analyses, the consistency of the pattern observed provides a substantial basis for concluding that the Implementation Grant projects using the TENN Instructional Plan were effective.

The strength and consistency of these results are especially impressive given the conditions of the project and its evaluation. For example, the evaluation was based on assessments carried out by local school personnel (many of whom had limited backgrounds for this task), and the design and sample limitations mediated <u>against</u> finding statistically significant differences. Even more important, however, was the fact that the TENN Instructional Plan was implemented entirely by local school personnel--i.e., with no orientation or training by the curriculum developers. As with evaluation of the field test version of the Instructional Plan, students were exposed to the Plan for just one school year, even though the model for the TENN Plan is a sequential and integrated 13-year program (Banta et al., 1981). Again, it is relevant to note that although some progress might be expected each year, the total impact logically would be the comprehensive product of participation in the total program.

TABLE 1

Differences in Nutrition Knowledge, Attitudes, and Practices of Elementary School Children in Relation to Treatment Group: Individual as Unit of Analysis

	Treatment Group			Comparison Group					
	N	$\bar{x}$	SD	N	$\bar{x}$	SD	F	df	p
Kindergarten									
Multivariate analysis							10.36	3, 431	.00001*
Univariate analyses									
Knowledge	235	13.15	3.52	201	11.82	3.54	3.94	434	.0001*
Attitudes	234	1.78	.22	201	1.69	.19	4.61	433	.00001*
Practices	234	1.75	.19	201	1.74	.20	.37	433	.71
Grade 1									
Multivariate analysis							13.05	3, 436	.01*
Univariate analyses									
Knowledge	245	14.96	2.97	196	13.37	3.23	5.39	439	.00001*
Attitudes	245	1.84	.18	195	1.77	.19	4.11	438	.00001*
Practices	245	1.81	.19	195	1.79	.18	.71	438	.48
Grade 2									
Multivariate analysis							3.71	3, 511	.01*
Univariate analyses									
Knowledge	284	11.83	2.98	231	11.07	2.85	2.94	513	.01*
Attitudes	284	2.83	.39	231	2.32	.33	1.60	513	.11
Practices	284	1.68	.21	231	1.65	.20	1.40	513	.16
Grade 3									
Multivariate analysis							15.29	3, 439	.01*
Univariate analyses									
Knowledge	258	13.07	2.72	185	11.25	3.09	6.42[a]	365	.01*
Attitudes	258	2.38	.40	185	2.34	.40	1.04	441	.30
Practices	258	1.69	.20	185	1.69	.20	.04	441	.97
Grade 4									
Multivariate analysis							6.53	3, 502	.0002*
Univariate analyses									
Knowledge	258	10.80	3.79	248	9.42	3.55	4.22	504	.00001*
Attitudes	258	2.93	.42	248	2.93	.37	.12	504	.90
Practices	258	2.19	.30	248	2.17	.26	.62	504	.54
Grade 5									
Multivariate analysis							2.77	3, 510	.04*
Univariate analyses									
Knowledge	275	11.68	3.92	239	10.87	4.15	2.25	512	.02*
Attitudes	275	2.92	.36	239	2.86	.38	2.00	512	.05*
Practices	275	2.14	.28	239	2.11	.28	1.38	512	.17
Grade 6									
Multivariate analysis							6.04	3, 466	.0005*
Univariate analyses									
Knowledge	243	13.02	3.92	227	11.68	4.10	3.64	468	.0003*
Attitudes	243	2.94	.35	227	2.84	.35	2.97	468	.003*
Practices	243	2.11	.25	227	2.08	.27	1.20	468	.23

[a]This test was computed using separate variances because of a significant homogeneity of variance test. All others were computed using pooled variances.

*Statistic meets criterion for significance.

TABLE 2

Differences in Nutrition Knowledge, Attitudes, and Practices of Elementary School Children in Relation to Treatment Group: School as Unit of Analysis

	Treatment Group			Comparison Group					
	N	$\bar{x}$	SD	N	$\bar{x}$	SD	F	df	p
Kindergarten									
Multivariate analysis							2.04	3, 18	.14
Univariate analyses									
Knowledge	11	12.94	1.55	11	11.48	2.12	1.84	20	.08
Attitudes	11	1.77	.09	11	1.69	.08	2.11	20	.05*
Practices	11	1.74	.05	11	1.75	.04	.64	20	.53
Grade 1									
Multivariate analysis							2.03	3, 18	.15
Univariate analyses									
Knowledge	11	14.98	1.43	11	13.38	1.46	2.59	20	.02*
Attitudes	11	1.84	.06	11	1.79	.08	1.53	20	.14
Practices	11	1.81	.06	11	1.81	.07	.15	20	.88
Grade 2									
Multivariate analysis							2.24	3, 18	.12
Univariate analyses									
Knowledge	11	11.88	.73	11	10.92	1.00	2.57	20	.02*
Attitudes	11	2.39	.15	11	2.31	.10	1.46	20	.16
Practices	11	1.68	.07	11	1.65	.06	.88	20	.39
Grade 3									
Multivariate analysis							7.94	3, 17	.002*
Univariate analyses									
Knowledge	11	12.94	1.02	10	11.52	1.56	2.49	19	.02*
Attitudes	11	2.40	.12	10	2.29	.20	1.55	19	.14
Practices	11	1.69	.06	10	1.70	.05	.28	19	.78
Grade 4									
Multivariate analysis							2.50	3, 18	.09
Univariate analyses									
Knowledge	11	10.87	1.50	11	9.38	1.52	2.31	20	.03*
Attitudes	11	2.94	.13	11	2.92	.15	.20	20	.84
Practices	11	2.19	.07	11	2.18	.08	.48	20	.63
Grade 5									
Multivariate analysis							.40	3, 18	.75
Univariate analyses									
Knowledge	11	11.59	1.64	11	11.05	1.83	.73	20	.48
Attitudes	11	2.92	.13	11	2.89	.15	.49	20	.63
Practices	11	2.15	.10	11	2.12	.09	.68	20	.51
Grade 6									
Multivariate analysis							1.58	3, 16	.23
Univariate analyses									
Knowledge	10	12.67	1.86	10	11.46	1.53	1.59	18	.13
Attitudes	10	2.93	.12	10	2.82	.08	2.22	18	.04*
Practices	10	2.11	.05	10	2.08	.09	.83	18	.42

Note. All tests were computed using pooled variances because the test for homogeneity of variance was not significant for any set of data.

*Statistic meets criterion for significance.

As with previous analyses of implementation of the TENN Instructional Plan, the most positive results were noted on the knowledge dimension, with fewer significant results for attitudes and none for practices. And as in previous years, both methodological and theoretical explanations can be given. That is, one explanation may come from the fact that reliability indices for the attitudes and practices scales were lower than were corresponding indices for the knowledge scales, particularly for students at the lower grade levels. A second explanation (still untested) is that with more time the apparent gains by students would be extended to attitudes and eventually to practices. However, the initial knowledge gain should provide a foundation for maintenance of any subsequent changes in practices.

A caveat to be considered with the results of this evaluation is related to the motivational factor. It is logical to expect that students and teachers in the schools that applied for (and received) Implementation Grants were more motivated than students and teachers in other schools that did not show this degree of interest. That the students in the schools taking such initiative would have better scores at the end of the year may reflect some influence by the school personnel's commitment to nutrition education. However, motivation is an integral part of the implementation of any educational program, and it is only if that motivation is reinforced and channeled into an appropriate program that results can be expected. Thus, it is impossible to determine the extent to which differences in favor of the treatment schools reflect such exposure in interaction with a predisposing attitude toward nutrition education. However, it does seem reasonable to conclude that motivated school personnel using the materials may expect positive results.

In summary, the Implementation Grant program using the TENN Instructional Plan for grades K-6 appears to have been effective. Results of analyses of student knowledge, attitudes, and practices were consistent and positive. Certainly there are unanswered questions about specific aspects of the Plan and the nutrition education programs developed around it, but the general conclusion warrants an unequivocal recommendation for continued implementation of nutrition education programs based on the TENN Instructional Plan for grades K-6.

Perceptions of Nutrition Education

Wilma Jozwiak

The instrument "Assessment of Knowledge, Attitudes, and Practices and Perceptions of Nutrition Education" contained a section designed to assess students' perceptions of nutrition education. That section of items is analyzed separately in the following report.

Acquiring accurate knowledge about nutrition may have little impact on children if their perceptions of food-related issues remain unchanged. In order to determine whether childrens' perceptions also were being changed through instruction in nutrition education as provided through the Implementation Grant project, items designed to measure perceptions were included in the assessment instrument. Each of the three student instrument forms used in this evaluation contained seven items which elicited the student's perceptions of nutrition and nutrition-related issues. In addition, forms for grades 2-3 and 4,5,6 contained seven statements about school food service with which the student was asked to agree or disagree. (The items and percentages of response for each are presented in Tables F1-F3 which appear in Appendix F.)

Although it is instructive simply to visually compare the responses of students from treatment and control schools, one may strengthen the comparison through statistical analysis. Data from all three forms were subjected to the Chi Square test of association. Forms for grades 2-3 and 4,5,6 also were subjected to t test analysis. Only those differences which attained the .05 level of significance will be discussed in this report. The reader is invited to inspect the tables for other differences, which, although not of statistical significance, may be of interest.

Children from treatment schools in grade 6 were more likely than their control counterparts to express positive reactions to the food fixed for lunch at their schools (73% of treatment school 6th graders marked one of the two positive responses as compared with 66% of the control school 6th graders).

The students were asked to indicate their feelings concerning learning about foods that are "good for you." Both first and fifth graders in treatment schools tended to respond more positively than did control school students.

Kindergarten and first grade students from treatment schools were more likely than their control counterparts to state that they always ate the school lunch. (First grade control students ate the school lunch about 77% of the time as compared with 84% for treatment first graders, whereas kindergarten students from control schools reported eating the school lunch 72% of the time in comparison with 85% of the time for treatment school kindergarten students.) Kindergarten students from treatment schools also were more likely to think that they had an impact on the decisions concerning foods that would be served for lunch (48% versus 35%), than were grade 1 students from treatment schools (36% versus 26%).

Treatment school students in grades kindergarten through 3 also were more likely than control school students to agree (by a margin of from 10 to 17 percent) that they learned from their teachers about foods that were "good

for them" than were control school students in those grades. Third grade treatment school students were 9% more likely than control school students in the third grade to say that they never learn at home about foods that are "good for you" (23% versus 14%).

The seven items relating to students' perceptions of the ways in which school food service could be improved gave the students a chance to express their opinions about the food, the variety of choices, the speed of service, the cost of food, and the serving sizes. Generally speaking, the students from treatment schools tended to give responses that indicated a greater awareness of food and nutrition-related issues. Second grade treatment school students were 25% less likely than control school students to think students should be offered more choices (58% versus 33%). Third grade treatment school students were 13% less likely than their control counterparts to think that the school food service should serve better tasting food (61% versus 74%). Sixth grade students in treatment schools were less likely than control school sixth graders to think that service should be faster (37% versus 48%). This trend repeated itself with third graders -- 39% of treatment school third graders thought service should be faster in comparison with 51% of control school third grade students. On the whole, though, all students' responses were in favor of each proposed change, reflecting the typical disdain expressed by persons in this society for food prepared in an institution.

Several of the differences between control and treatment school students' responses on these perception items, although statistically significant, may be of little practical significance -- for instance, a difference of 7% between 77% and 84% on a particular item may be considered an insufficient basis for making changes in instruction. However, these differences are part of a trend which becomes evident when one examines the number of "positive" responses at each grade level. These responses indicate a greater awareness of nutrition-related issues on the part of students in treatment schools as compared with students in control schools. The trend of kindergarten and first grade treatment school students' responses was quite positive: five out of seven responses indicated a more positive perception than that of control school students. Five of six first grade treatment school students' responses were more positive and one was the same as control students' responses. The trend of responses given by second grade treatment school students was negative (seven negative responses to five positive responses) except for responses on the questions about school food service, on which the treatment school students tended to be more tolerant (six positive to one negative). Third grade treatment school students' responses reflected a positive trend (eight positive to six negative), as did fourth and fifth grade treatment school students' responses (eight to five and seven to six). On the other hand, sixth grade treatment school students' response trend was negative (six positive responses to seven negative ones).

On the whole, the responses and response trends on the perception items of the nutrition assessment suggest that nutrition-related perceptions may be positively affected by nutrition education. The relatively small degree of change may be a result of the inherent difficulty of changing perceptions. However, the necessity for changing perceptions before behaviors can be changed reliably makes it important to consider ways to increase such changes. Until more research can be conducted on specific activities which are more successful in producing positive changes in nutrition-related perceptions, it is helpful to have evidence that the children who received well-planned and coordinated nutrition education via the Implementation Grant program tended to have more positive perceptions.

SECTION III. TEACHER'S LOG OF NUTRITION EDUCATION ACTIVITIES

Trudy W. Banta

Parts of the TENN Instructional Plan Used Most Frequently

The form "Teacher's Log of Nutrition Education Activities" (see Appendix C) was completed during the first half of the 1981-82 school year by 422 teachers representing 18 of 21 participating school systems, and during the second half of the year by 185 teachers representing 15 systems. Because the number of respondents for the latter half of the year was so small, data from both semesters were combined for this report.

Teachers were asked to list from the TENN Instructional Plan the page numbers of instructional activities which they had used with their students. With few exceptions, every page containing student activities was used by at least one teacher. In Tables 3-9 the page numbers used most frequently throughout the school year at each grade level are listed, along with the activity numbers on those pages which were used most often. If more than one activity number is listed, the activities are identified in descending order by frequency of use, i.e., the most-used activity is listed first. Table 10 contains a listing of frequently-used pages that contained no activities for children.

During the 1981-82 school year the TENN Instructional Plan pages used by the greatest number of teachers (55 or more) were, in descending order: 16, 13, 12, 18, 62, and 122. Apparently teachers were more likely to use the Instructional Plan content which appeared first in the section for their grade level. More than 60 percent of the pages used most frequently at each of the seven grade levels were contained in the first ten pages of the section developed for the given grade. Since the Instructional Plan was organized to present material related to each goal in sequence at each grade level, the data on page usage indicate that teachers focused most attention on Goal 1 -- demonstrating the relationship of nutrition to health.

Approximately 10 percent of all nutrition education activities reported by teachers associated with Implementation Grant projects did not contain a reference to a specific page and/or activity number from the TENN Instructional Plan. Of these 111 unreferenced activities, slightly more than half (57) appeared to be ones that were included in the TENN Instructional Plan, although not necessarily at the grade level for which they were used. Of the remaining 54 activities, some had been considered but rejected for inclusion in the Plan (e.g., "The Great American Chocolate Factory"), some had not been considered (e.g., "Snoopy, the Germ Fighter"), some were not explained in enough detail to be recognizable as a specific activity (e.g., "puppets"), some were related to objectives covered at other levels of the TENN framework and therefore not covered in the K-6 Instructional Plan (e.g., "talked about four systems of the body--how they interact"), and some were tangential to the topics included in the TENN Plan (e.g., "Mystery of Molar Mountain"--film on care of teeth). The majority of the additional activities listed were variations on ones that were included in the Plan (e.g., other films and filmstrips). Very few of the additional activities were ones that probably would not fit within the philosophy and criteria on which the TENN Instructional Plan was based.

Resources Used in Nutrition Education Instruction

During the first half of the year no more than 15 percent (average = 12%) of the teachers at any grade level involved school food service personnel as resource persons in their nutrition education programs. During the second half of the year the average of 12 percent did not change, but the percentage of fourth grade teachers using food service personnel increased from 8 to 19 percent, and the percentage of sixth grade teachers increased from 13 to 19 percent. (Percentages at all other grade levels dropped slightly.) Teachers in Macon County and Monroe County school systems were more than twice as likely as teachers in most other systems to utilize food service personnel.

The percentage of teachers involving parents as resource persons decreased from 18 percent in the earlier part of the year to 12 percent in the latter part. Throughout the school year more than 20 percent of the teachers in the Sumner County school system utilized parent assistance. Use of persons from the community remained stable: 8 percent during the first semester and 9 percent during the second. In the second half of the year all teachers in the Hamilton County system and 77% of those in the Macon County system brought in assistance from the community.

During both halves of the 1981-82 school year approximately 63 percent of the teachers completing the Teacher's Log reported that they used printed materials to teach nutrition education. In general the percentage using print media rose from kindergarten through grade 6.

The percentage of teachers using audio-visual materials to teach nutrition was approximately 43 percent each semester, with teachers in grades 3-6 reporting higher usage rates than those in grades K-2.

Food was used as a teaching material by 30 percent of all teachers during the first semester, and by 27 percent during the second. Kindergarten teachers were almost twice as likely to use food as were teachers at any other grade level.

Ratings of Student Learning and Interest

Teachers were asked to rate on a five-point scale student learning and student interest in the nutrition education activities taken from the TENN Instructional Plan. As indicated in Table 11 mean ratings for both learning and interest were quite high throughout the school year. However, teachers in grades 1 and 2 consistently felt their students were more interested, and learned more, than students in grades 4 and 5.

TABLE 3

Frequency of Use by Kindergarten Teachers
of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
K	12	64	Basic requirements for life and growth, and the role of nutrition in relation to health	1	20	Growing seeds, observe growth under various conditions
				2	15	Growing plants in class
				3	14	Caring for animals in class
				4	13	Trace child's body to show growth
	13	71	"	8	29	Select clothing for different types of weather
				7	16	Select books about life and growth for reading corner
				6	12	View film about feeding habits of animals
	16	81	Role of snacks and meals in relation to health	2	31	Plan tasting party using nutritious snacks
				5	23	Use food models or pictures to illustrate nutritious snacks
				1	13	Show filmstrip "The Snacking House"
	17	24	Taste sensations associated with food; sensory experiences with food	1	17	Have children identify foods by smell alone
	18	65	"	6	27	Read and discuss Green Eggs and Ham
				3	18	Have tasting party emphasizing different taste sensations
	20	35	Relationship between food patterns and family background	3	12	Plan a birthday party each month asking children to select foods to serve; invite parents
	21	26	"	6	18	Feature holiday foods on a bulletin board
	23	23	Nutritious snacks and simple uncooked snacks	3	12	Plan tasting party using nutritious snacks; invite parents and food service personnel
	24	26	Role of cleanliness in preparing and eating food	1	23	Wash hands before preparing or eating food
	25	47	"	2	28	Establish hand-washing routine prior to eating meals and snacks

TABLE 4

Frequency of Use by First Grade Teachers
of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
1	35	25	Relationship between activity level and energy requirements	1	11	Relate the workings of a wind-up car to those of the human body
	38	29	Kinds of foods needed each day	1	15	Plan activities to acquaint children with a variety of foods
	39	30	"	5	9	Have children make a picture booklet with different foods
	41	33	Relationship between how people feel and the food they eat	7	10	Read and discuss The Very Hungry Caterpillar
				6	7	Read and discuss Two Greedy Bears
	43	17	Relationship between physical setting and reactions to food	1	7	Work with food service manager and decorate the cafeteria
	44	17	"	3	7	Eat lunch or snack outdoors; discuss feelings about being outside versus in the cafeteria
	48	14	Major food sources	2	9	Show children pictures of various foods and discuss whether they come from plants or animals

TABLE 5

Frequency of Use by Second Grade Teachers
of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
2	62	64	Logical groupings for food	4	26	Have students complete worksheets on food groups
				2	16	Introduce children to the Five Food Groups
				3	11	Have students play game based on identification of foods in the Five Food Groups
	63	35	"	6	15	Use magazine pictures to make posters or mobiles illustrating the Five Food Groups
				5	11	Classify foods served for breakfast or lunch in the Five Food Groups
	65	32	Foods and food combinations eaten by people to keep them healthy	4	17	Have children identify foods that they like
	68	16	Relationship between the presence and behavior of others and reactions to food	2	9	Use role play to have children compare how they would feel in a variety of mealtime situations
	70	15	Foods available at different times of the year	1	9	Develop a bulletin board showing seasonal foods for spring, summer, fall, and winter
	78	26	Edible portions of various plants; animals from which foods are obtained	5	5	Have children match foods with the appropriate animal source
				6	5	Play Animal and Plant Bingo on cards with pictures of various foods
				7	5	Have children complete food source activity sheets
				8	5	Read and discuss a book on farming such as The Farm Book

TABLE 6

Frequency of Use by Third Grade Teachers
of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
3	118	15	Relationship between growth and food intake; contributions of food to meeting growth needs	1	7	Read and discuss The Growing Story
				2	6	Keep and discuss a growth record for each child
	121	30	Nutrient categories	2	18	Using models or pictures, ask children to group those with similar nutrient content
				1	8	Use food/nutrient comparison cards
	122	45	"	4	17	View and discuss film about nutrients
				5	13	Discuss nutrient content of the lunch served at school
	126	22	Relationship between health and dietary practices	1	16	View and discuss the filmstrip, "Tooth-town, USA"
	128	13	Sensations and perceptions produced by different foods and combinations of foods	4	8	Read The Bake-Off and taste carrots prepared in cooked and raw state
	131	12	Processes of food production, distribution, and consumption	3	3	Show and discuss a film about food production
				4	3	Read and discuss books about food production, distribution, and consumption
				5	3	Choose a food children like and trace steps involved in its production, distribution and consumption
	133	44	Good sources of nutrients and energy	5	14	Display on bulletin board pictures of foods that are good sources of nutrients and energy
				2	9	Use parents and/or food service manager to assist in giving a tasting party involving foods high in nutrients and energy
				3	9	Use scrambled word game that involves foods that are good sources of nutrients and energy

TABLE 7

Frequency of Use by Fourth Grade Teachers of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
4	150	50	Primary functions of protein, carbohydrate, and fat	2	21	Show and discuss filmstrip about functions of protein, carbohydrate, and fat
				1	18	Use transparencies to introduce the nutrients protein, carbohydrate, and fat
				3	11	Have children complete programmed instruction related to protein, carbohydrate, and fat
	157	31	Characteristics of food in various cultures	5	8	Conduct tasting parties using foods from various cultures
				3	7	Invite person who has lived or traveled abroad to visit and talk about the ways foods are prepared and served in that country
				1	6	In social studies units identify the characteristics of foods in various cultures
	163	26	Factors that influence food availability in various regions	4	9	Use maps or globes to discuss where some foods are likely to be available
				3	6	Have children plan a day's menu using only locally grown food
				2	5	In social studies units discuss reasons that some foods are more available in some regions of the world than others
	166	15	Adequacy of food supply in various geographic areas; food- and nutrition-related problems of people in various geographic areas and socio-cultural groups	2	10	Discuss the problem of food waste
	169	17	Foods typical of various cultures that are good sources of nutrients and energy	3	6	In social studies units identify foods typical of various cultures
				2	4	Make food mobiles for the nutrients protein, carbohydrate, and fat
				5	4	Have children taste foods from other cultures that are good sources of nutrients and energy
	172	14	Types of food preservation and preparation used in various cultures	4	4	Have children taste food preserved in different ways
				8	3	Have children prepare and taste dishes which represent types of food preparation in various cultures

TABLE 8

Frequency of Use by Fifth Grade Teachers of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
5	188	25	Primary functions of vitamins, minerals, and water	2	9	Show film on functions of vitamins, minerals, and water
				3	8	Have children complete programmed learning activity on vitamins, minerals, and water
				1	8	Use transparencies to introduce the nutrients vitamins, minerals, and water
	186	16	"	6	4	Soak chicken bones in vinegar to illustrate the function of calcium
	193	29	Relationship between food intake and physical appearance and vitality	3	11	Have each child perform a pinch test
				2	8	Discuss how physical appearance and vitality will be affected if more or fewer servings than recommended are consumed for each group of foods
				1	6	Show a film about fitness, such as "Keeping in Top Shape"
	196	38	Relationship of food selection to dietary adequacy	4	10	Divide class into groups and ask each to choose food items for breakfast, lunch, and supper
				6	10	Have children make posters, collages, mobiles, exhibits, or booklets to illustrate the food groups and number of servings needed daily
	205	21	Relationship between socio-cultural heritage and family eating patterns	6	7	Discuss foods eaten by different families on each of several holidays
				2	4	Have children taste regional foods in class
				3	4	During studies of different regions of the U.S. identify the cultural heritage that has influenced the foods consumed in that area
	212	11	Steps in solving food- and nutrition-related problems; roles assumed by people with different resources for solution of food- and nutrition-related problems; comparison of processes for solving different food- and nutrition-related problems	2	5	Divide the class into groups and present children with problem situations
				1	4	Introduce children to the problem-solving process by identifying the steps in the process

TABLE 9

Frequency of Use by Sixth Grade Teachers of Pages and Activities in TENN Instructional Plan

Grade	Page Number	Number of Teachers Reporting Usage	Topic	Activity Number	Number of Teachers Reporting Usage	Activity
6	230	26	Relationship between nutrition and digestion	1	8	Have children draw a simple diagram of the digestive tract; use an example of food and trace its digestion
				3	6	Show and discuss a film on digestion
				4	5	Discuss different kinds of teeth people have
	233	10	Energy and nutrient needs of people at different ages	1	7	Have children calculate the difference between caloric needs of the members of their families
	234	14	Relationship between food characteristics and patterns of food acceptance	1	13	Have children list six favorite foods then discuss characteristics important to them in determining their food preferences
	235	9	"	3	7	Have children plan a daily menu that includes their favorite foods, then discuss factors that determine their acceptance of new foods
	238	16	Common food sources of sugar, starch, fat, protein, vitamins, and minerals	4	7	Make nutrient mobiles
				3	6	Investigate food product labels and determine which foods have a high sugar content
	242	26	Ideas people have about the role of food and nutrition in consumer and health topics; goals related to food and nutrition that are supported by various interest groups; relationship between goals of people in various groups and their choices of alternatives for solving food- and nutrition-related problems.	4	11	Analyze newspaper and magazine ads, radio and TV ads, and compare the factors that might entice a person to buy various foods
	246	7	Credibility of sources of information about food and nutrition	3	4	Prepare a bulletin board with pictures of different sources of information about food and nutrition

TABLE 10

Frequently-Used Pages Containing No Activities for Children

Grade Level	Page Number
1	37 & 45
2	61, 64 & 67
3	129
4	149

TABLE 11

Mean Values for Student Learning and Interest

During First and Second Semesters

		First Semester		Second Semester	
		Mean	Rank	Mean	Rank
Grade K	Learning	4.44	1	4.17	5
	Interest	4.55	1	4.29	5
Grade 1	Learning	4.20	3	4.37	2
	Interest	4.48	3	4.44	2
Grade 2	Learning	4.38	2	4.42	1
	Interest	4.52	2	4.44	1
Grade 3	Learning	4.19	4	4.26	4
	Interest	4.29	4	4.35	4
Grade 4	Learning	4.01	6	4.05	6
	Interest	4.19	6	4.16	6
Grade 5	Learning	3.99	7	4.02	7
	Interest	4.18	7	4.11	7
Grade 6	Learning	4.15	5	4.27	3
	Interest	4.20	5	4.37	3

SECTION IV. RESULTS FROM THE TEAMING TO TEACH NUTRITION QUESTIONNAIRE

Wilma Jozwiak

One of the teaching options stressed in the TENN Instructional Plan was the use of teams to deliver nutrition instruction. The teams most commonly referred to consisted of the classroom teacher and the food service manager/worker, or the teacher and one or more parents. However, many of the activities included in the Instructional Plan could be implemented with the team effort of any number of persons from the school community. Because the use of teams to deliver instruction has been reported to be successful in many areas, including nutrition, it was decided to survey those who participated in the Implementation Grant projects as treatment and control teachers to determine:

(1) the number using teams to teach nutrition,

(2) the kinds of persons participating in the teams, and

(3) the types of instructional activities used by teams.

It was necessary first to determine what activities typically are included in the development and delivery of instruction. Referring to the literature and to persons actively involved in this area of education, a list of activities included in developing and delivering instruction was constructed. The list included: (a) developing goals and/or objectives, (b) providing background information, (c) planning activities, (d) conducting activities, (e) developing materials, and (f) evaluating activities and/or programs. An additional "other" category was included to allow for activities which did not fit this classification system.

A second undertaking was the development of a list of individuals from the school community who might form part of an instructional team. This list included: (a) nutrition specialists such as nutritionists and dietitians, (b) food service personnel, (c) other classroom teachers, (d) building-level supervisors, (3) system-level supervisors, (f) media specialists or librarians, (g) school support staff such as clerks and custodians, (h) students, and (i) parents.

The lists of activities and types of personnel were combined to develop the "Teaming to Teach Nutrition Questionnaire" which is presented in Appendix D. These instruments were mailed to all teachers in the Implementation Grant program. Usable questionnaires were returned by 51 of 63 treatment school teachers and 41 of 56 control school teachers.

Teacher responses on the "Teaming to Teach Nutrition Questionnaire" were subjected to Chi Square analysis to determine if differences existed between control and treatment teachers in their use of teams to deliver nutrition instruction. (Responses are presented in Table 12.) In all cases except one (the use of students) there was a statistically significant (at .05 level) difference between the groups. In addition, treatment school teachers were much more likely than their control school counterparts to involve the team members at some level in each of the instructional development and delivery activities.

The extent to which treatment school teachers reported involving other school community members in the provision of nutrition instruction is remarkable. Not only was teaming demonstrated to be a productive means of providing instruction, but it also seems likely that by involving other persons in the instructional process, these teachers increased the commitment of additional personnel to future nutrition education attempts. Anecdotal data included on some questionnaires by treatment school teachers indicated that they enjoyed involving others in their classrooms, and that the students seemed to enjoy and benefit from receiving instruction from persons working with their classroom teachers. Finally, there seems to have been an improvement in rapport between students and the food service personnel in their schools.

TABLE 12

Percentages of Treatment and Control Group Teachers Reporting Use of Various Personnel in Teaching Nutrition

Type of Personnel	% Treatment Teachers Reporting Use	% Control Teachers Reporting Use
Nutrition Specialists	55	19
Food Service Personnel	86	19
Other Teachers	63	22
Building-Level Supervisors	44	7
Media Specialists	63	37
System-Level Supervisors	29	4
Support Staff	33	11
Students	96	85
Parents	71	22

SECTION V. END-OF-YEAR ASSESSMENTS BY PROJECT PERSONNEL

Trudy W. Banta

Assessment by Project Directors

Fifteen of the 21 Implementation Grant project directors completed and returned the survey form entitled "NET Implementation Grant Questionnaire for Project Directors" (see Appendix E).

Half of the directors who responded said that the training provided for teachers and others connected with their project had taken place during a single time period (usually 2-4 hours). Several training sessions over a short time period were offered by 42 percent of the projects, and 8 percent included continuous training throughout the school year. Ratings of quality and quantity of training provided by these project leaders indicated that they were more satisfied with the efficacy of continuous training and training offered in several sessions than with that offered in a single session.

Twenty percent of the project directors reported that training was given only prior to the school year, 40 percent said it was provided only after the beginning of school, and 40 percent said training was given both before and after the year began. Ratings ranging from 1 (Not Appropriate) to 3 (Somewhat Appropriate) to 5 (Very Appropriate) which were given for quantity and quality of training were much higher for projects offering "both before and after" training (means of 4.3 and 4.3) and were least favorable (means of 2.6 and 2.7) for projects that offered training only after school had started.

Responses of project directors revealed that training was provided by a variety of professionals:

Classroom teachers	28%
Nutrition education specialists	20%
School food service supervisors	16%
Curriculum supervisors	12%
Others: (principal, librarian, lunchroom manager, State NET Director)	24%

The total number of hours spent in training teachers participating in Implementation Grant projects varied from 1 (reported by one project) to 36 (also reported by one project), but more than half the project directors reported that the time spent was 2, 3, or 4 hours. The longer the training period, the more satisfied project directors were with its quantity and quality. On a scale of 1 (Not Appropriate) to 5 (Very Appropriate), the respondents gave mean ratings of 3 for quantity of training and 3.2 for quality to training of 1 or 2 hours duration and mean ratings of 3.7 and 3.7 respectively to quantity and quality of training of more than 6 hours duration.

Project directors provided the following mean ratings (1 = Not Appropriate, 3 = Somewhat Appropriate, 5 = Very Appropriate) for factors associated with carrying out the Implementation Grant projects in their schools:

TENN Instructional Plan	4.53
State guidelines for the project application	4.27
Extent of cooperative teaming to provide instruction	4.07
Quality of training provided for project participants	3.67
Quantity of training provided for project participants	3.47

Project directors apparently were more satisfied with the TENN Instructional Plan than with any other aspect of the project. They felt that more time and effort should have been devoted to training.

Project directors were asked to rate on a 5-point scale (1 = None, 3 = Moderate, 5 = Extensive) the level of interest in, support for, or involvement of each of several groups in connection with the Implementation Grant project. As the mean ratings recorded below indicate, project directors considered student interest to be quite high, but also gave high marks to teacher enthusiasm and support from school-level and system-level administrators. The level of parent involvement was considered modest.

Student interest	4.47
Support from school-level administrators	4.07
Teacher enthusiasm	3.93
Support from system-level administrators	3.80
Cooperative teaming to provide instruction	3.73
Participation by food service manager	3.27
Parent involvement	2.53

Project directors were asked to use a 5-point scale to rate in two ways (extent of use and level of effectiveness) the materials provided by the State NET Director as part of the Implementation Grant project. Respondents perceived that activity kits and manuals for students were used most and were most effective. However, all of the materials were rated 4 or higher.

Material	Mean Rating for Extent of Use	Mean Rating Level of Effectiveness
Activity kits and manuals for students	4.47	4.40
Books for students	4.07	4.20
References for teachers	4.07	4.13

When asked to indicate the extent to which the TENN Instructional Plan would be used during 1982-83 on a scale ranging from 1 = Not at all, to 3 = Moderately, to 5 = Extensively, project directors provided responses which yielded a mean of 3.86.

Finally, project directors were given an opportunity to identify the "most significant benefits" and the "most significant disadvantages" of the Implementation Grant project in their school or school system.

Benefits identified by more than one director are listed below in order by frequency of mention:

(1) increased student awareness of nutrition and its relationship to health and growth.

(2) acquisition of good materials for use in teaching nutrition.

(3) increase in students' opportunities to try new and different foods.

(4) increase in student awareness of other cultures.

Disadvantages listed by more than one project director included:

(1) lack of time to devote to the project.

(2) inability to acquire some of the materials that were needed for instruction.

(3) frustration created by the amount of record-keeping and reporting required by the Implementation Grant project.

Assessment by Teachers

The survey form entitled "NET Implementation Grant Questionnaire for Teachers" (see Appendix E) was completed and returned by 244 K-6 teachers representing 15 school systems. Niney-seven percent of the teachers responding indicated that they had used the TENN Instructional Plan in teaching nutrition education during the 1981-82 school year.

Teachers first were asked to use a 5-point scale (1 = Not effective, 3 = Somewhat effective, 5 = Very effective) to indicate the level of effectiveness of several features of the Implementation Grant project as carried out in their schools. The means recorded below suggest that teachers were most satisfied with the TENN Instructional Plan and with the extent of cooperative teaming to provide instruction, and were somewhat less favorably impressed with the quality and quantity of training they had received.

TENN Instructional Plan	3.79
Extent of cooperative teaming to provide instruction	3.56
Quality of training provided for project participants	3.37
Quantity of training provided for project participants	3.30

Teachers representing school systems that provided training in several sessions over a short period of time were more satisfied with the quantity and quality of their training than were teachers employed in systems providing training in a single session or continuously throughout the school year. Teachers from systems providing training only prior to the beginning of the school year rated their training lower in effectiveness than did teachers from systems providing training only after the beginning of the school year or both before and after the beginning of the year. Teachers representing systems providing 1-2 hours of training rated quantity and quality of training more favorably than did teachers who experienced longer training periods.

Systems in which teachers gave highest ratings to extent of cooperative teaming to provide instruction included:

Jackson City	4.33
Perry County	3.92
Monroe County	3.81
Jackson County	3.75

Teachers were asked to indicate the level of interest in, support for, or involvement of several groups in connection with the Implementation Grant project. The response format was a 5-point scale with 1 = None, 3 = Moderate, 5 = Extensive. The mean ratings, recorded below, suggest that teachers considered student interest to be high, with support from school-level administrators and teacher enthusiasm as additional positive aspects of the project. Student interest was given a mean rating of more than 4 by teachers in six of the fifteen school systems represented in the sample. Parent involvement was considered to be the weakest of those project features listed. Only in Maury County and Macon County schools systems was parent involvement rated above the "moderate" level (i.e., mean of more than 3).

Student interest	4.01
Support from school-level administrators	3.97
Teacher enthusiasm	3.92
Participation by food service manager	3.62
Support from system-level administrators	3.59
Parent involvement	2.64

Teachers were asked to rate in two ways (extent of use and level of effectiveness) three types of materials provided by the State NET Director as part of the Implementation Grant project. Mean ratings for use and effectiveness reported below indicate that teachers showed a slight preference for the teacher references, but in general made more than a moderate amount of use of all the materials, and considered them of more than moderate effectiveness. Sixty-five percent of the respondents reported a usage level of 4 or 5 for the teacher references and 67 percent gave the references a 4 or 5 rating for effectiveness.

Material	Mean Rating for Extent of Use	Mean Rating for Level of Effectiveness
References for teachers	3.77	3.78
Activity kits and manuals for students	3.68	3.75
Books for students	3.52	3.57

Teachers in the Jackson County, Maury County, Trenton Special, and Greene County school systems indicated the highest levels (means of 4 or higher) of usage of student activity kits and manuals.

Teachers were asked to estimate on a 5-point scale (1 = Not at all, 3 = Moderately, 5 = Extensively) the extent to which they would use the TENN Instructional Plan in teaching nutrition education during 1982-83. The mean response was 3.63, with 94 percent of the teachers indicating that they would use the Plan at least moderately. In seven of the fifteen school systems represented all teachers said they would make at least moderate use of the Plan during the coming year.

Teachers identified as the "most significant benefits" of the Implementation Grant project:

(1) the excellent instructional materials the project had provided,

(2) the increase which occurred in student awareness of nutrition and its importance to health and growth, and

(3) the increase in opportunities for students to read about and taste new foods.

The "most significant disadvantages" which teachers associated with the project included:

(1) insufficient time to teach nutrition,

(2) insufficient time to plan instructional activities and/or obtain materials,

(3) insufficient time to complete the paper work involved in the project,

(4) difficulty in maintaining student interest throughout the school year, and

(5) insufficient training.

Assessment By Food Service Managers

A total of 17 food service managers representing 13 school systems completed and returned the survey form entitled "NET Implementation Grant Questionnaire for Food Service Managers" (see Appendix E).

The managers who responded apparently considered themselves to have been rather extensively involved in the Implementation Grant projects: on a 5-point scale (1 = Not at all, 3 = Somewhat, 5 = A lot) the managers marked only responses 3, 4, or 5, for a mean rating of 4.

Managers were asked to indicate whether or not they had engaged in each of a dozen activities as part of the nutrition education program in their school during the 1981-82 school year. The percentage of managers responding positively to each item is recorded below.

Item	Percentage
Invited parents or others to join the students for lunch	94.1
Assisted in providing "tasting parties" for students	88.2
Allowed students and/or parents to decorate the eating area (e.g., posters, wall paintings, plants)	86.7
Presented or helped to present instructional activities	84.6
Increased variety of foods served	80.0
Offered "trial" servings of unfamiliar foods	80.0
Provided background information and/or materials for classroom instruction	80.0
Allowed students to help plan menus	66.7
Changed serving size	58.3
Changed food preparation methods	58.3
Offered alternative serving procedures such as a self-service salad bar	45.5
Allowed students to help in preparing food	16.7

Managers were most likely to invite parents or others to join students for lunch, but most became even more actively involved by providing tasting parties, allowing students to decorate the eating area, assisting with classroom instruction and increasing the variety of foods served for lunch. They were least likely to allow students to help in preparing food and to institute alternative serving procedures in the cafeteria.

Food service managers were asked for their perceptions regarding the level of interest or involvement of teachers, students, and parents in the nutrition education program carried out in their school. The response format was a 5-point scale with 1 = None, 3 = Moderate, 5 = Extensive. As the means reported below indicate, student interest was rated highest and parent involvement lowest. Both student interest and teacher enthusiasm were considered well above the "moderate" level.

Student interest	3.88
Teacher enthusiasm	3.82
Parent involvement	2.65

Summary

Participating teachers and project directors were in substantial agreement on their ratings of the effectiveness of various features of the Implementation Grant project. Highest ratings were given to the TENN Instructional Plan, and to the extent of cooperative teaming to provide instruction which characterized the project. Both groups were somewhat less satisfied with the quality and quantity of training provided for participants, but all four sets of ratings by teachers and project directors were quite positive -- above 3, the mid-point of the rating scale.

Several sessions conducted over a short span of time was the training mode preferred by teachers. More specifically, three one-hour training sessions or two two-hour sessions provided shortly after the beginning of the school year appeared to constitute the optimum training program for nutrition education.

Teachers, project directors, and food service managers gave high ratings, 3.8 or above on a 5-point continuum, to student interest and teacher enthusiasm for the Implementation Grant project as carried out in their school. All three groups considered parent involvement in the project to have been modest: 2.5 or 2.6 on the 5-point scale.

Participation in the Implementation Grant project by food service managers was considered well above the "moderate" level by project directors (3.27 rating), teachers (3.62), and the food service managers themselves (4). Since 94 percent of the responding food service managers said they had invited parents to join students for lunch, apparently the managers made a significant contribution to the involvement of parents in the nutrition education program, and could perhaps do most to increase that participation in future efforts to do so.

Teachers and project directors were satisfied with the support for the project which they received from school-level administrators (ratings of 3.97 by teachers and 4.07 by project directors) and system-level administrators (ratings of 3.59 by teachers and 3.8 by project directors).

Both teachers and project directors gave very high marks (3.57 to 4.4) to the effectiveness of the instructional materials which were provided as part of the Implementation Grant project. When asked to name the "most signigicant benefits" of the project, "excellent instructional materials" were at the top of the list given by teachers and second on the list given by project directors.

Two other "significant benefits" identified independently by teachers and project directors were identical: increased student awareness of nutrition and its relationship to health and growth, and increased opportunities for students to read about and taste new foods. Both groups predicted that substantial use would be made of the TENN Instructional Plan during 1982-83. There was even agreement that the most significant limitations of the Implementation Grant project were the lack of time to teach nutrition, plan instructional activities, obtain materials, and complete the paper work involved in documenting achievements.

REFERENCES

Banta, T.W., et al. Evaluation of the Tennessee Nutrition Education and Training Program: 1980 final report. Knoxville: The University of Tennessee, 1980.

Banta, T.W., et al. Evaluation of the Tennessee Nutrition Education and Training Program: 1981 final report. Knoxville: The University of Tennessee, 1981.

Cunningham, J.L., Skinner, J.D., Cagle, L.C., Miller, S.W., and Teets, S.T. Development of CANKAP--A multidimensional measure of nutritional beliefs. Journal of Nutrition Education, 1981, 13, 190-194.

Tennessee Department of Education. TENN Nutrition Education Instructional Plan, Kindergarten through Grade 6. Nashville: 1981.

APPENDIX A

MATERIALS SUGGESTED AS SUPPLEMENTS TO THE TENN INSTRUCTIONAL PLAN

List to aid in ordering materials listed in RESOURCE GUIDE.
List compiled August, 1982 (based upon 1981 list.)

MATERIALS CONTAINED IN NUTRITION EDUCATION KIT
TO SUPPLEMENT TENN. INSTRUCTIONAL PLAN
(27 Items; Value $245.00)

TEACHER REFERENCE

Goodwin, M. T. & Pollen, G. - Creative Food Experiences for Children (Book) 1980. Center for Science in the Public Interest, 1775 S. Street, N.W., Washington, D.C. 20009. Cost: $5.95. (Unable to confirm as of 1982.)

Includes techniques for teaching young children a variety of concepts through experiences with foods, recipes, and nutrition information.

Hamilton, E.M. & Whitney, E. - Nutrition: Concepts & Controversies (Textbook) 1979. West Publishing Company, P.O. Box 3256, St. Paul, MN 55165. Cost: $19.95

Introductory nutrition textbook with sections on current food and nutrition related controversies.

Largen, V. L. - Guide to Good Food (Textbook) 1979. The Goodheart-Wilcox Co., Inc., 123 W. Taft Drive, South Holland, IL 60473. Cost: $11.97

General textbook with sections related to the importance of food, the management of food, meal planning, and foods of the world. Colorful illustrations.

Weiss, E. and Pettit, N. - Eclipse of the Blue Moon Foods: A Guide to Teaching Food Education (Book) 1979. Cooperative Food Education Project, & Agricultural Marketing Project, P.O. Box 120495, Nashville, TN 37212 Cost: $7.95

Curriculum guide of lesson plans for teaching various topics related to food and nutrition. It is designed to be used with children in grades 4-6.

OTHER AIDS

Fruit and Vegetable Models (Plastic Models: Two Packs) - National School Products, 114 West Broadway, Maryville, TN 37801. Cost: Fruit - $4.95, Vegetable - $5.50 (Unable to confirm as of 1982.)

Life-like pieces of plastic fruits (10 pieces) and vegetables (10 pieces).

Nutrition and You: A Nutrition Education Program for Children in the Primary Grades (Student Books One, Two and Three) 1979. BFA - CBS Education Publishing, 2211 Michigan Avenue, Department 9117, Santa Monica, CA 90404. Cost: $4.50 each.

A series of three activity books for children in the primary grades. Includes a variety of worksheets related to food and nutrition concepts.

Sterigel Classroom Set (Science Kit) - Carolina Biological Supply Co., Burlington, NC 27215. Cost: 1 each $13.20 Refer to C 50746 when you write or order. 10 or more $11.90 each.

Materials to use to make agar dishes; illustrates growth of microorganisms. Set contains supplies for 40 students.

Hoban, R. - Bread and Jam for Frances, 1964. Scholastic Book Services, 908 Sylvan Avenue, Englewood Cliffs, NJ 07632. Cost: $1.95 list price, $1.46 net price.

Story of Frances, who learns to eat foods other than bread and jam. Primary.

Hoban, R. - Dinner at Alberta's, 1975. Thomas Y. Cromwell Company, New York. Order from; Harper and Row Publishers, Inc., Scranton, PA 18512. Cost $8.95

Story about Arthur Crocodile learning to use proper table manners and teaching etiquette to a friend. Primary.

Katzman, S. M. - For Kids Who Cook: Recipes and Treats, 1977. Holt, Rinehart and Winston, 383 Madison Avenue, New York, NY 10017. Cost: $6.50 (As of 1982 out of print.

52 recipes collected from author who runs a Kitchen School for kids - easy to make and fun to prepare. Techniques of cooking and uses of utensils are simply and clearly explained. Riddles, jokes and puzzles included. Intermediate.

Krauss, R. - The Carrot Seed, 1971. Scholastic Book Services, 904 Sylvan Avenue, Englewood, NJ 07632. Cost: $1.25 (Unable to confirm as of 1982.)

Story of a small boy who plants a carrot seed and patiently waits for it to grow.

Krauss, R. - The Growing Story, 1947. Harper and Row Publishers, 10 East 53rd Street, New York, NY 10032. Cost: $8.95

Story of a little boy who wants to grow bigger. Primary.

Paul, E. and Hawkins, A. - Kids Cooking: A First Cookbook for Children, 1970. Doubleday and Company, Inc., School and Library Division, 501 Franklin Avenue, Garden City, NY 11530. Cost: $5.95 (Out of print as of 1982.)

Recipes for mealtime dishes, snacks, and regional United States foods. Incorporates convenience foods. Primary and intermediate.

Perl, L. - Hunter's Stew and Hangtown Fry--What Pioneer America Ate and Why, 1977. Seabury, NY. Order from: Houghton and Mifflin, College Division, Wayside Road, Burlington, MA 01803. Cost: $8.95. Include 8% for shipping & handling; also add sales tax.

Culinary contributions of groups who have settled in various regions of the United States. Includes 20 authentic recipes. Intermediate.

Perl, L. - Slumps, Grunts, and Snickerdoodles--What Colonial America Ate and Why, 1975. Seabury, NY. Order from: Houghton and Mifflin, Wayside Road, Burlington, MA 01803. Cost: $8.95+include 8% for handling charges and sales tax.

Describes life and customs in the original colonies as reflected in the foods harvested and prepared. Includes 13 authentic recipes. Intermediate.

Politi, L. - Three Stalks of Corn, 1976. Charles Scribners' Sons, 597 5th Avenue, New York, NY 10017. Cost: $6.95 Shipment not made for books under $25.00 list price. Will ship 1-4 books ordered if prepaid.

Weiss, E. and Pettit, N. Eclipse of the Blue Moon Foods: A Food Education Student Workbook, 1979. Cooperative Food Education Project, % Agricultural Marketing Project, P.O. Box 120495, Nashville, TN 37212, Cost: $1.50 (Unable to confirm as of 1982.)

An activity book for grades 4-6 which focuses on food and what it does for the body. Includes recipes, games, and other activity sheets.

Your Body for Life: A Nutrition Action Program for Elementary Schools, (Elementary Grades 1-3), (Kit) 1979. Educational Services, Tupperware Home Parties, Dart Industries, P.O. Box 2353, Orlando, FL 32802. Cost: $29.95

A kit designed to teach students how food affects their bodies. Helps them recognize the importance of nutritious food choices. Includes teacher guide, filmstrips, cassettes, puppets, game, and food pictures.

Your Body for Life: A Nutrition Action Program for Elementary Schools, (Elementary Grades 4-6), (Kit) 1979. Educational Services, Tupperware Home Parties, Dart Industries, P.O. Box 2353, Orlando, FL 32802. Cost $29.95

A kit designed to teach students how food affects their bodies. Helps them recognize the importance of nutritious food choices. Includes teacher guide, filmstrips, cassettes, game, and food pictures.

BOOKS

Bernich, D. and Bershad, C. - The Doofus Stories, 1978. Learning for Life, Management Sciences for Health, 141 Tremont Street, Boston, MA 02111. Cost: $6.95 1-10 copies. 11 or more copies $5.95

Story of how Doofus, a large bird, learns how to be physically fit. Primary.

Cauley, L. - The Bake-Off, 1978. G.P. Putnam's Sons, 200 Madison Avenue, New York, NY 10016. Cost $6.29

Story of a rabbit who wins first prize in a bake-off contest with an unusual recipe. Primary.

Clymer, E. - Hamburgers--and Ice Cream for Dessert, 1975. E.P. Dutton and Company, #2 Park Avenue, New York, NY 10016. Cost: $7.95

Story of how a boy and his community learn to eat a variety of foods. Primary.

Ginsburg, M. - Two Greedy Bears, 1976. MacMillan Publishing Company, Front and Brown Streets, Riverside, NJ 08370. Cost: $8.95

Colorful book about two bears, each of whom tries to eat and drink more than the other. Primary.

Story of the importance of corn in Mexican diet. Describes a child and her grandmother teaching the class how to make tacos and enchiladas. Other recipes included. Intermediate.

Also included:

Delton, Judy - Rabbit Finds A Way, 1975. Crown Publishers, Inc., 34 Engelhard Avenue, Avenel, New Jersey 07001. Cost: $4.95 (hardback)

This is a story about expectations and problem-solving suitable for K-3 students. "What Rabbit learns about expectations and how he finally gets his carrot cake will win chuckles from beginning readers."

Veitch, Beverly and Harms, Thelma - COOK AND LEARN Recipes Steps, 1981. Addison - Wesley Publishing Co., Innovative Division, 2725 Sand Hill Road, Menlo Park, CA 94025. Cost: $17.50

Provides enlarged illustrations of individual steps for 50 selected recipes to guide the child visually step-by-step to the delicious end result! Helps the teacher get started by eliminating the need for hand preparation of cards.

A special bonus: 20 blackline masters for newsletters to inform parents and extend the classroom experience to the home.

APPENDIX B

TENNESSEE'S GOALS AND OBJECTIVES FOR NUTRITION EDUCATION

OVERALL GOALS AND OBJECTIVES

The high school graduate will be able to:

GOAL I: Understand the relationship of nutrition to health.

- Objective 1: Demonstrate understanding of the role of nutrition in human development.
- Objective 2: Demonstrate understanding of dietary adequacy.
- Objective 3: Demonstrate understanding of the relationship between dietary practices and health.

GOAL II: Understand the relationship between individual and environmental characteristics and food-related behavior.

- Objective 1: Demonstrate understanding of the roles of sensation and perception of food characteristics on food-related behavior.
- Objective 2: Demonstrate understanding of the relationship between the physical and sociocultural environments and food-related behavior.
- Objective 3: Demonstrate understanding of the relationship between individual circumstances and food-related behavior.

GOAL III: Understand the physical and chemical properties of food.

- Objective 1: Demonstrate understanding of the sources of food.
- Objective 2: Demonstrate understanding of the nutrient and energy composition of food.
- Objective 3: Demonstrate understanding of how the physical and chemical properties of food affect its preparation and storage.

GOAL IV: Understand the nature and means for resolution of food- and nutrition-related concerns.

- Objective 1: Demonstrate understanding of food- and nutrition-related problems and issues relevant to self, community, and the world.
- Objective 2: Demonstrate understanding of use of resources for solving food- and nutrition-related problems and analyzing issues.
- Objective 3: Demonstrate understanding of the problem-solving process in relation to food- and nutrition-related concerns.

APPENDIX C

TEACHER'S LOG OF NUTRITION EDUCATION ACTIVITIES

School (1-4) _____ Grade (5) _____ Teacher (6-7) _____

TEACHER'S LOG OF NUTRITION EDUCATION ACTIVITIES

Date	Activity		Time spent				Student involvement		Evaluation		Resources							Comments
			Student participation		Teacher preparation						People			Materials			Other	
	Page number	Activity number	Hours	Minutes	Hours	Minutes	Number participating	Number meeting objectives	Student learning (Lo → Hi)	Student interest (Lo → Hi)	School food service personnel	Parents	Community resource people	Printed media	Audio-visual media	Food		
(11-14)	(15-17)	(18-19)	(20-21)	(22-23)	(24-25)	(26-27)	(28-29)	(30-31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
									1 2 3 4 5	1 2 3 4 5	Y N	Y N	Y N	Y N	Y N	Y N	Y N	

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APPENDIX D

TEAMING TO TEACH NUTRITION QUESTIONNAIRE

NAME_____ 1981-82 Teaching situation: School_____

Grade_____

TEAMING TO TEACH NUTRITION QUESTIONNAIRE

1. Please circle the number beside the correct response below to indicate whether you taught nutrition to your students during the 1981-82 school year

   1 = No, I did not teach nutrition to my students during the 1981-82 school year.

   2 = Yes, I did teach nutrition to my students during the 1981-82 school year.

2. If you answered Yes to Question 1, please use the blank below to estimate the total number of student contact hours you spent in providing nutriti education to your students during the 1981-82 school year.

   _____student contact hours

IF YOU ANSWERED NO TO QUESTION 1, PLEASE STOP AT THIS POINT AND RETURN THE QUESTIONNAIRE IN THE ENCLOSED STAMPED SELF-ADDRESSED ENVELOPE. IF YOU ANSWE YES TO QUESTION 1, PLEASE CONTINUE WITH THE QUESTIONNAIRE.

3. Involvement in teaming to teach may take several forms. Below are listed some of the ways involvement may occur and groups of persons who may be involved. Please read each item carefully. Circle a number in each item to indicate whether you involved persons from that group in implementing nutrition education in your classroom during the 1981-82 school year. For each group of persons whom you involved in nutrition education, please circle a number beside each listed activity to indicate the degree to which persons from that group were involved in that activity.

A. (1) Please circle the number beside the correct response below to indicate whether you involved NUTRITION EXPERTS (e.g., nutritionists, dietitians) in nutrition education during the 1981-82 school year.

1 = No

2 = Yes

(2) IF YOU ANSWERED YES, please circle the appropriate numbers below to indicate the degree to which nutrition experts were involved in each of the listed activities.

	Never 0% of the time	Seldom 1-33% of the time	Some-times 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ activities	1	2	3	4	5
Providing back-ground information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe_____	1	2	3	4	5

B. (1) Please circle the number beside the correct response below to indicate whether you involved SCHOOL FOOD SERVICE PERSONNEL in nutrition education during the 1981-82 school year.

1 = No

2 = Yes

(2) IF YOU ANSWERED YES, please circle the appropriate numbers below to indicate the degree to which school food service personnel were involved in each of the listed activities.

	Never 0% of the time	Seldom 1-33% of the time	Some-times 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ activities	1	2	3	4	5
Providing back-ground information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

C. (1) Please circle the number beside the correct response below to indicate whether you involved OTHER TEACHERS in nutrition education during the 1981-82 school year.

1 = No

2 = Yes

(2) IF YOU ANSWERED YES, please circle the appropriate numbers below to indicate the degree to which other teachers were involved in each of the listed activities.

	Never 0% of the time	Seldom 1-33% of the time	Some-times 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ activities	1	2	3	4	5
Providing back-ground information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

D. (1) Please circle the number beside the correct response below to indicate whether you involved BUILDING-LEVEL ADMINISTRATORS in nutrition education during the 1981-82 school year.

1 = No

2 = Yes

(2) IF YOU ANSWERED YES, please circle the appropriate numbers below to indicate the degree to which building-level administrators were involved in each of the listed activities.

	Never 0% of the time	Seldom 1-33% of the time	Some-times 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ activities	1	2	3	4	5
Providing back-ground information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

E. SYSTEM-LEVEL SUPERVISORS IN AREAS OTHER THAN NUTRITION such as curriculum supervisors and subject-matter specialists were involved in nutrition education by:

	Never 0% of the time	Seldom 1-33% of the time	Some-times 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ objectives	1	2	3	4	5
Providing back-ground information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

F. MEDIA SPECIALISTS OR LIBRARIANS were involved in nutrition education by:

	Never 0% of the time	Seldom 1-33% of the time	Some-times 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ objectives	1	2	3	4	5
Providing back-ground information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

G. **OTHER SCHOOL SUPPORT STAFF** such as paraprofessional aides, guidance counselors, clerical personnel, and maintenance staff were involved in nutrition education by:

	Never 0% of the time	Seldom 1-33% of the time	Sometimes 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ objectives	1	2	3	4	5
Providing background information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

H. **STUDENTS** were involved in nutrition education by:

	Never 0% of the time	Seldom 1-33% of the time	Sometimes 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ objectives	1	2	3	4	5
Providing background information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

I. **PARENTS** were involved in nutrition education by:

	Never 0% of the time	Seldom 1-33% of the time	Sometimes 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ objectives	1	2	3	4	5
Providing background information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

J. **OTHER COMMUNITY RESOURCE PERSONS** (volunteers with no special expertise in nutrition) were involved in nutrition education by:

	Never 0% of the time	Seldom 1-33% of the time	Sometimes 34-66% of the time	Usually 67-99% of the time	Always 100% of the time
Developing goals/ objectives	1	2	3	4	5
Providing background information	1	2	3	4	5
Planning an activity	1	2	3	4	5
Developing materials	1	2	3	4	5
Conducting an activity	1	2	3	4	5
Evaluating an activity/program	1	2	3	4	5
Other (Please describe)_____	1	2	3	4	5

_____

Please return the completed questionnaire in the enclosed stamped self-addressed envelope

APPENDIX E

END OF YEAR ASSESSMENT INSTRUMENTS
FOR
PROJECT DIRECTORS
TEACHERS
FOOD SERVICE MANAGERS

(cc 1-3) School_____

(cc 4-5) School system_____ 56

NET Implementation Grant Questionnaire for Project Directors

(cc 6) 1. Please circle a number for <u>each item</u> below to indicate the kind of training that was provided for teachers and/or others who participated in your NET Implementation Grant Project.

(a) <u>Distribution of training</u>

1 = Training provided during a single time period (a portion of a day or more)

2 = Training provided in several sessions over a short time period

3 = Training provided continuously throughout the school year

(cc 7) (b) <u>Time of training</u>

1 = Training provided only prior to the beginning of the school year

2 = Training provided only after the beginning of the school year

3 = Training provided bothe before and after the school year began

(cc 8) (c) Who conducted training for teachers in the use of the TENN Instructional Plan?

1 = School food service supervisor

2 = Nutrition education specialist

3 = Curriculum supervisor

4 = Classroom teacher

5 = Parent

6 = Other (Please describe)_____

(cc 9-10) 2. Please estimate the total number of hours spent ir training participants in your Project.

_____hours

3. Please think about any previous experience you have had in learning how to use educational programs and/or materials. Then circle a number beside each item below to indicate how you would rate the Implementation Grant Project in your school on each of the following:

		Much less effective	Somewhat less effective	About the same	Somewhat more effective	Much more effective
(cc 11)	State guidelines for project design	1	2	3	4	5
(cc 12)	Quantity of training provided for Project participants	1	2	3	4	5
(cc 13)	Quality of training provided for Project participants	1	2	3	4	5
(cc 14)	TENN Instructional Plan	1	2	3	4	5
(cc 15)	Additional instructional materials provided by State NET Director	1	2	3	4	5
(cc 16)	Support from school-level administrators	1	2	3	4	5
(cc 17)	Support from system-level administrators	1	2	3	4	5
(cc 18)	Student interest	1	2	3	4	5
(cc 19)	Teacher enthusiasm	1	2	3	4	5
(cc 20)	Parent involvement	1	2	3	4	5
(cc 21)	Cooperative teaming to provide instruction	1	2	3	4	5

3. Please rate the extent of use of each type of material provided by the State NET Director to your school/school system as a part of the Implementation Project by circling a number beside each item.

		Not at all		Moderately		Extensively
(cc 22)	References for teachers	1	2	3	4	5
(cc 23)	Books for students	1	2	3	4	5
(cc 24)	Activity kits and manuals for students	1	2	3	4	5

4. Please rate the effectiveness of each of the materials provided by the State NET Director to your school/school system as a part of the Implementation Project by circling a number beside each item.

		Not at all		Moderately		Extensively
(cc 25)	References for teachers	1	2	3	4	5
(cc 26)	Books for students	1	2	3	4	5
(cc 27)	Activity kits and manuals for students	1	2	3	4	5

5. In your opinion, what were the most significant benefits of the Implementation Grant Project in your school/school system? (Please list.)

6. In your opinion, what were the most significant disadvantages of the Implementation Grant Project in your school/school system? (Please list.)

(cc 28) 7. Please try to estimate the extent to which the TENN Instructional Plan will be used in your school/school system next school year (1982-83) (Circle a number below to indicate your estimate of use.)

1	2	3	4	5
Not at all		Moderately		Extensively

(cc 1-3) School_____

(cc 4-5) School system_____ 59

(cc 6) Grade taught_____

NET Implementation Grant Questionnaire for Teachers

(cc 7) 1. Please circle the number beside the correct response below to indicate whether you used the TENN Instructional Plan in teaching nutrition education during the 1981-82 school year.

1 = No

2 = Yes

2. Please think about previous experience you have had in learning how to use educational programs and/or materials. Then circle a number beside each item to indicate how you would rate the Implementation Grant Project in your school on each of the following:

		Much less effective	Somewhat less effective	About the same	Somewhat more effective	Much more effective
(cc 8)	Quantity of training provided for project participants	1	2	3	4	5
(cc 9)	Quality of training provided for project participants	1	2	3	4	5
(cc 10)	TENN Instructional Plan	1	2	3	4	5
(cc 11)	Additional instructional materials provided by State NET Director	1	2	3	4	5
(cc 12)	Support from school-level administrators	1	2	3	4	5
(cc 13)	Support from system-level administrators	1	2	3	4	5
(cc 14)	Student interest	1	2	3	4	5
(cc 15)	Teacher enthusiam	1	2	3	4	5
(cc 16)	Parent involvement	1	2	3	4	5
(cc 17)	Cooperative teaming to provide instruction	1	2	3	4	5

3. Please rate the extent to which you used each type of material provided by the State NET Director to your school/school system as a part of the Implementation Project by circling a number beside each item.

		Not at all		Moderately		Extensively
(cc 18)	References for teachers	1	2	3	4	5
(cc 19)	Books for students	1	2	3	4	5
(cc 20)	Activity kits and manuals for students	1	2	3	4	5

4. Please rate the effectiveness of each of the materials provided by the State NET Director to your school/school system as a part of the Implementation Project by circling a number beside each item.

		Not effective		Somewhat effective		Very effective
(cc 21)	References for teachers	1	2	3	4	5
(cc 22)	Books for students	1	2	3	4	5
(cc 23)	Activity kits and manuals for students	1	2	3	4	5

5. In your opinion, what were the most significant benefits of the Implementation Project in your school? (Please list.)

6. In your opinion, what were the most significant disadvantages of the Implementation Project in your school? (Please list.)

(cc 24) 7. Please try to estimate the extent to which you will use the TENN Instructional Plan in teaching nutrition education next year (1982-83). (Circle a number below to indicate your estimate of use.)

1	2	3	4	5
Not at all		Moderately		Extensively

(cc 1-3) School_____

(cc 4-5) School system_____61

NET Implementation Grant Questionnaire for Food Service Managers

(cc 6) 1. To what extent did you participate in the NET Implementation Grant Project to teach nutrition education in your school? (Circle a number below to indicate how you were involved.)

1	2	3	4	5
Not at all		Somewhat		A lot

2. Please place a check mark in the appropriate box beside each activity listed below to indicate whether you participated in that acticity as a part of nutrition education in your school during the 1981-82 school year.

	No	Yes	
(cc 7)			Did not participate
(cc 8)			Assisted in providing "tasting parties" for students
(cc 9)			Allowed students and/or parents to decorate the eating area (e.g., posters, wall paintings, plants)
(cc 10)			Provided background information and/or materials for classroom instruction
(cc 11)			Presented or helped to present instructional activities
(cc 12)			Invited parents of others to join the students for lunch
(cc 13)			Allowed students to help in preparing food
(cc 14)			Allowed students to help plan menus
(cc 15)			Changed serving size
(cc 16)			Increased variety of foods served
(cc 17)			Changed food preparation methods
(cc 18)			Offered "trial" servings of unfamiliar foods
(cc 19)			Offered alternative serving procedures such as a self-service salad bar

3. Please circle the number beside each item below to indicate how you would rate the nutrition education program in your school.

		Extremely effective	Somewhat effective	I had no opportunity to observe	Not very effective	Not at al effective
(cc 20)	Teacher enthusiasm for nutrition education	1	2	3	4	5
(cc 21)	Student interest in nutrition education	1	2	3	4	5
(cc 22)	Parent involvement in nutrition education	1	2	3	4	5

APPENDIX F

STUDENT RESPONSES TO ASSESSMENT INSTRUMENT ITEMS CONCERNING PERCEPTIONS OF NUTRITION EDUCATION

TABLE F-1

PERCENTAGE RESPONSES TO PERCEPTION ITEMS ON THE NET ASSESSMENT INSTRUMENT

FORM 7 - STUDENTS (Grades 4-6)

ITEM		1			2			3			4		
		4 th	5 th	6 th	4 th	5 th	6 th	4 th	5 th	6 th	4 th	5 th	6 th
(1) How do you feel about the food that is fixed for lunch at your school?	Control	9	11	17	12	19	17	43	51	47	36	19	19
	Treatment	9	9	10	12	18	16	46	55	61	33	18	12
(2) How do you feel about learning about foods that are good for you?	Control	4	3	7	7	11	10	28	24	37	61	63	47
	Treatment	2	1	1	6	4	5	27	29	36	65	66	57
(3) How do you feel about helping decide what food you will have for lunch at your school?	Control	5	6	2	9	5	7	21	25	20	64	64	72
	Treatment	6	5	2	7	8	5	21	20	20	67	67	73

ITEM		Never			Sometimes			Always		
		4th	5th	6th	4th	5th	6th	4 th	5th	6th
(14) How often do you eat the lunch fixed at your school?	Control	6*	4	7	32	35	35	62	61	58
	Treatment	2	4	5	31	37	25	68	59	70
(15) How often do you help someone at your school decide what will be served for lunch at your school?	Control	45	60	57	40	30	36	16	11	7
	Treatment	53	59	58	37	31	36	10	11	6
(16) How often do your learn from your teacher about foods that are good for you?	Control	7	9	10	58	54	55	35	37	35
	Treatment	6	5	3	31	39	39	64	56	58
(17) How often do you learn from someone at home about foods that are good for you?	Control	12	8	10	43	37	39	45	55	51
	Treatment	15	6	8	49	46	49	36	48	43

ITEM	Fourth Grade				Fifth Grade				Sixth Grade			
	Control		Treatment		Control		Treatment		Control		Treatment	
The school food service program should:	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
(1) Serve more different kinds of foods.	83	17	82	18	81	19	83	17	85	15	88	13
(2) Give students more choices (for example, salad bar, different kinds of drinks, different kinds of desserts).	66	34	73	27	78	22	80	20	83	17	82	18
(3) Serve better tasting food.	71	29	73	27	80	20	75	25	80	20	76	24
(4) Give bigger servings on the plate.	58	42	56	44	63	37	64	36	70	30	71	29
(5) Students should be able to help plan meals and ways of doing things in the cafeteria.	68	32	67	33	68	32	74	26	73	27	77	23
(6) Service should be faster.	44	56	30	70	49	51	42	58	48	52	37	63
(7) Food prices should be lower.	86	14	86	14	86	14	84	16	89	11	89	11

TABLE F-2.

PERCENTAGE RESPONSES TO PERCEPTION ITEMS ON THE NET ASSESSMENT INSTRUMENT

FORM 8 - STUDENTS (Grades 2-3)

ITEM		1		2		3	
		2nd	3rd	2nd	3rd	2nd	3rd
(1) How do you feel about the food that is fixed for lunch at your school?	Control	5	11	25	31	70	58
	Treatment	6	10	32	46	62	45
(2) How do you feel about learning about foods that are good for you?	Control	3	4	10	11	86	84
	Treatment	2	3	12	14	86	83
(3) How do you feel about helping decide what food you will have for lunch at your school?	Control	8	10	20	22	71	69
	Treatment	8	4	26	25	66	71

ITEM		Never		Always	
		2nd	3rd	2nd	3rd
(9) Do you eat the lunch prepared at your school?	Control	13	16	87	84
	Treatment	13	17	87	83
(10) Do you help someone at your school decide what will be served for lunch?	Control	69	75	31	25
	Treatment	74	77	26	23
(11) Do you learn from your teacher about foods that are good for you?	Control	17	12	83	88
	Treatment	8	2	92	98
(12) Do you learn from someone at home about foods that are good for you?	Control	14	14	86	86
	Treatment	19	23	81	77

ITEM	Second Grade				Third Grade			
	Control		Treatment		Control		Treatment	
School food service program should:	Yes	No	Yes	No	Yes	No	Yes	No
(1) Serve more different kinds of foods.	79	21	72	28	84	16	77	23
(2) Give students more choices (for example, salad bar, different kinds of drinks, different kinds of desserts).	67	33	58	42	71	29	69	31
(3) Serve better tasting food.	69	31	61	39	74	26	61	39
(4) Give bigger servings on the plate.			45	55	52	48	46	54
(5) Students should be able to help plan meals and ways of doing things in the cafeteria.	61	39	64	36	61	39	69	31
(6) Service should be faster.	48	52	43	57	51	49	39	61
(7) Food prices should be lower.	76	24	82	18	87	13	81	19

TABLE F-3.

PERCENTAGE RESPONSES TO PERCEPTION ITEMS ON THE NET ASSESSMENT INSTRUMENT

FORM 9 - STUDENTS (Grades K-1)

ITEM		1 I don't like it.		2 I like it.	
		K	1st	K	1st
(1) How do you feel about the food that is fixed for lunch at your school?	Control	15	12	85	88
	Treatment	14	12	86	88
(2) How do you feel about learning about foods that are good for you?	Control	12	9	88	91
	Treatment	14	3	86	97
(3) How do you feel about helping decide what food you will have for lunch at your school?	Control*	21	21	18	79
	Treatment	80	15	82	85

*rounding error

ITEM		Never		Always	
		K	1st	K	1st
(9) Do you eat the lunch fixed at your school?	Control	28	23	72	77
	Treatment	15	16	85	84
(10) Do you help someone at your school decide what will be served for lunch?	Control	65	74	35	26
	Treatment	52	64	48	36
(11) Do you learn from your teacher about foods that are good for you?	Control	17	26	83	74
	Treatment	8	5	92	95
(12) Do you learn from someone at home about foods that are good for you?	Control	27	22	73	78
	Treatment	29	23	71	77